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CLAIMS:

1. A steam ironing device comprising a steam iron (1) having a housing (2), a soleplate (3) at the bottom side of said housing, and at least one discharge opening (4) in said soleplate (3), said device comprising means for generating mist steam (5) and for delivering said generated mist steam (5) from said at least one discharge opening (4), and control means (6) for controlling the delivery of said mist steam (5),
5 characterized in that
the iron (1) is provided with means for generating superheated steam (7) and with a plurality of second discharge openings (8) in the soleplate (3) for the delivery of said superheated steam (7).
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2. A steam ironing device as claimed in claim 1, characterized in that said at least one mist steam discharge opening (4) for mist steam (5) is provided in a tip area (9) of the soleplate (3).
- 15 3. A steam ironing device as claimed in claim 1 or 2, characterized in that the device comprises
- a steam generator (10),
 - heating means (11) for heating said steam generator (10),
 - water supply means (12),
20 - a water passage (13) between the water supply means (12) and the steam generator (10),
 - an electric pump (14) for the delivery of water (15) through said water passage (13) from the water supply means (12) to the steam generator (10),
and said iron (1) comprises
 - a first steam passage (16) between the steam generator (10) and said plurality of second
25 discharge openings (8) for the delivery of superheated steam (7),
 - a second steam passage (17) between the steam generator (10) and the at least one mist discharge opening (4), and
 - a second water passage (18) between the pump (14) and the second steam passage (17).

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4. A steam ironing device as claimed in claim 3, characterized in that the iron comprises a heated chamber (20) or heated channel or a combination thereof located downstream of the first steam passage (16) for generating superheated steam (7).
5. A steam ironing device as claimed in claim 3 or 4, characterized in that the device comprises a water supply station (50), separate from said iron (1), said water supply station (50) comprising a water reservoir (12) and said electric pump (14).
6. A steam iron as claimed in claim 3, 4, or 5, characterized in that the first steam passage (16) between the steam generator (10) and the second steam discharge openings (8) for superheated steam (7) comprises a pressure-dependent valve (19).
7. A steam iron as claimed in claim 1 or 2, characterized in that the device comprises
- a steam generator (10) for generating mist steam (5),
 - water supply means (12),
 - a water passage (13) between the water supply means (12) and the steam generator (10),
 - an electric pump (14) for the delivery of water (15) through said water passage (13) from the water supply means (12) to the steam generator (10),
- and said iron comprises
- a heated chamber (20) for generating superheated steam (7), said heated chamber (20) being located downstream of the steam generator (10) and being in communication with said plurality of second discharge openings (8),
 - a first steam passage (21) between the steam generator (10) and the heated chamber (20),
 - a second steam passage (25) between the steam generator (10) and said at least one mist discharge opening (4),
- said device further comprising heating means for heating said steam generator (10) and said heated chamber (20).
8. A steam ironing device as claimed in claim 7, characterized in that the device comprises a steam generating station (60), separate from said iron (1), said steam generating station (60) comprising a water reservoir (12), said steam generator (10) for generating mist steam (5), and said electric pump (14).

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9. A steam iron as claimed in claim 1 or 2, characterized in that the device comprises a steam generating station (60), separate from said iron (1), which steam generating station (60) comprises a boiler (10) for generating hot water (15) and steam, said steam generating station (60) further comprising
- 5 - a first steam passage (21) connecting a steam space (45) of the boiler with the iron (1),
- a water passage (41) between said boiler (10) and said first steam passage (21) for introducing hot water (15) into said first steam passage (21),
- and said iron comprising
- 10 - a heated chamber (20) in communication with said first steam passage (21) for generating superheated steam (7), said heated chamber (20) being located downstream of the boiler (10) and being in communication with said plurality of second discharge openings (8),
- a first steam passage (21) between the boiler (10) and the heated chamber (20),
- a second steam passage (25) between the boiler (10) and said at least one mist discharge
- 15 opening (4),
- said device further comprising heating means (11, 44) for heating said heated chamber (20) and said boiler (10).
10. A steam ironing device as claimed in any one of the claims 3 to 9, characterized in that the iron (1) comprises a flow divider (24), and in that the soleplate (3) comprises a plurality of mist discharge openings (4), each opening (4) being connected to the flow divider (24) by means of a mist steam passage (25).
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11. A steam ironing device as claimed in claim 3, 4, or 5, characterized in that the iron (1) is provided with a cartridge (26) for additive liquid (27) and with means for adding said additive liquid (27) to the mist steam (5).
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12. A steam ironing device as claimed in claim 11, characterized in that the iron (1) comprises an additive liquid passage (28) for connecting the cartridge (26) with the second water passage (18) so as to obtain a diluted additive liquid downstream of said second water passage (18).
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13. A steam ironing device as claimed in any one of the claims 1 to 12, characterized in that the iron (1) is provided with a spray nozzle (29) in the front part (30) of

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the housing (2).

14. A steam ironing device as claimed in any one of the claims 1 to 12,
characterized in that the iron (1) comprises valve means (31-37) for adjusting the amount of
5 mist steam (5) and superheated steam (7) supplied to the respective discharge openings (4, 8).